

REMARKS

Claims 1-5, 7, 9-25, and 35 are pending. Claims 1, 19, 21 and 22 are amended. Claim 23 is canceled without prejudice. Claim 41 is added.

The amendments are supported in the application as filed and thus introduce no new matter. A suspension apparatus defining a longitudinal axis and including a first longitudinal end in fluid communication with a second longitudinal end is supported at least at p. 8 lines 20-22, FIG. 2, and FIG. 3. A suspension apparatus having a plurality of layers is supported at least at p. 8 lines 12-15, FIG. 3, FIG. 5, FIG. 7, and FIG. 8. A suspension apparatus where each layer includes a plurality of circumferential flow channels fluidly coupled by a plurality of radial flow channels, where adjacent layers of the plurality of layers are fluidly coupled by at least one axial flow channel, is supported at least at p. 9 lines 3-17, FIG. 3, FIG. 4, FIG. 5, FIG. 6, FIG. 7, FIG. 8A, FIG. 8B, FIG. 8C, and FIG. 8D.

Applicant respectfully requests consideration.

CLAIM REJECTIONS UNDER 35 U.S.C. § 102

Claims 1-3, 14-16, 19 and 20 are rejected under 35 U.S.C. § 102(b) as anticipated by Brown U.S. Patent No. 6,354,729. Applicant respectfully disagrees.

As shown in FIG. 1, Brown discloses a mixer having a housing 3 that defines an inlet 13 and an outlet 14. A rotating rotor 1 and two fixed stator rings 4 mix an incoming fluid passing from the inlet 13 to the outlet 14.

In contrast, pending claims 1-3, 14-16, 19, and 20 recite a suspension apparatus that includes a first longitudinal end in fluid communication with a second longitudinal end, and a plurality of layers disposed between the first and second longitudinal ends, where each layer includes a plurality of circumferential flow channels fluidly coupled by a plurality of radial flow channels, and where adjacent layers are fluidly coupled by at least one axial flow channel.

Because Brown fails to disclose a layered suspension apparatus, where each layer includes a plurality of circumferential flow channels fluidly coupled by a plurality of radial flow channels, and where adjacent layers are fluidly coupled by at least one axial flow channel, Brown cannot anticipate claims 1-3, 14-16, 19, and 20, and Applicant respectfully requests the rejection be withdrawn.

Claim 19 is rejected under 35 U.S.C. § 102(b) as anticipated by Kawasaki U.S. Patent No. 5,368,382. Applicant respectfully disagrees.

Kawasaki discloses a cement paste mixer. As shown in FIGS. 1A, 1B and 1C, the cement paste mixer includes a plurality of wall panels 1 having collision surfaces 2 and through-holes 3 arranged at predetermined intervals. As shown in FIG. 3, the wall panels 1 are assembled in an axial arrangement.

In contrast, claim 19 recites a plurality of circumferential flow channels fluidly coupled by a plurality of radial flow channels. Because Kawasaki fails to disclose a suspension apparatus having a plurality of circumferential flow channels fluidly coupled by a plurality of radial flow channels, Kawasaki cannot anticipate claim 19, and Applicant respectfully requests the rejection be withdrawn.

CLAIM REJECTIONS UNDER 35 U.S.C. §103

Claims 17 and 18 are rejected under 35 U.S.C. § 103(a) as obvious over Brown. Claims 17 and 18 depend from claim 16. Therefore, the rejections of claims 17 and 18 based on Brown are believed to be overcome for the reasons analyzed above.

Claims 4-7, 9-13, 22-25, and 35-40 are rejected under 35 U.S.C. § 103(a) as obvious over Hughes U.S. Patent No. 6,554,792, in view of Hodan U.S. Patent No. 5,137,369 and Hirose U.S. Patent No. 4,869,849. Applicant respectfully disagrees.

Claims 4-7, 9-13, and 35-39 recite "a plurality of circumferential flow channels coupled in fluid communication by said radial flow channels." Claims 22-25 and 40 include similar limitations.

The Examiner has conceded that Hughes does not disclose circumferential flow channels fluidly coupled by radial flow channels (pending Action, p. 9). Therefore, the Examiner relies on Hodan and Hirose as teaching the missing limitations.

As shown in Hodan Fig. 1, Hodan teaches a static mixer that includes a plurality of stacked plates 20a, 20b, 20c. As shown in Hodan Fig. 2, fluid enters a plate 20b through holes 25a where the fluid is directed through channels 22b defined by raised islands 24b, that direct the fluid to the exit holes 25b and, ultimately, to the next plate. The direction of fluid flow is shown in Hodan Fig. 2 with dashed arrows. Specifically, fluid enters the plate at the entrance holes 25a and then radiates away from the entrance hole, by way of channels 22b, to the exit holes 25b.

Thus, Hodan teaches a static mixer having a stack of plates, where the plates direct fluid flow from entrance holes radially outward to exit holes. The fluid flow is divided into split flows that collide with one another to create a mixing effect.

In contrast, claims 4-7, 9-13, 22-25, and 35-40 recite circumferential flow channels fluidly coupled by radial flow channels. The circumferential flow channels do not interfere to create mixing. Rather, they create many sub-volumes for receiving and suspending an agent. Hodan does not teach, suggest, or motivate circumferential flow, let alone circumferential flow channels. Applicant thus disputes the Examiner's argument.

On p. 10 of the Action, the Examiner drew what are alleged to be "circumferential flow channels" on the plate 20b shown in Hodan Fig. 2. However, these alleged circumferential flow channels contradict the direction of flow expressly illustrated with dashed arrows in Hodan Fig. 2. Essentially, the Examiner has attempted to replace Hodan's express teachings with "circumferential flow channels" that find no support whatsoever in Hodan, or the well established principles of fluid dynamics as explained in the accompanying Declaration filed under 37 C.F.R. §1.132.

As is clearly illustrated in Hodan Fig. 2, Hodan does not teach, suggest, or motivate circumferential flow channels fluidly coupled by radial flow channels.

The Examiner also applies Hirose as disclosing flow channels. However, the fluid flow achieved in Hirose's mixing device is even more arbitrary than that achieved in the Hodan's mixing device. Further, like Hodan, Hirose discloses creating interfering flows to achieve mixing, rather than creating sub-

volumes that suspend an agent. Applicant asserts that Hirose does not teach, suggest, or motivate circumferential flow channels fluidly coupled by radial flow channels.

Because Hughes in view of Hodan and Hirose fail to teach, suggest, or motivate the apparatus of claims 4-7, 9-13, 22-25 and 35-40, Applicant respectfully asserts that the Examiner has not established a *prima facie* case of obviousness.

Further, Hughes in view of Hodan and Hirose do not result in Applicant's advantages associated with a suspension apparatus having circumferential flow channels fluidly coupled by radial flow channels, which increase the number of sub-volumes (i.e., higher surface area) to desirably facilitate delivery of the contrast agent in a suspended state. As Applicant teaches at p. 13 lines 19-20:

The contrast agent 32 is delivered in a substantially suspended state due to the pre-administration confinement in sub-volumes in the set of channels 28, 56, and 59.

Rather, Hodan and Hirose are directed to mixing devices. See Titles: Static Mixing Device and Fluid Mixing Apparatus.

For at least these reasons, Applicant believes the rejections of claims 4-7, 9-13, 22-25, and 35-40 as obvious over Hughes in view of Hodan and Hirose are overcome, and respectfully requests the rejection be withdrawn.

CONCLUSION

The application is believed to be in condition for allowance with the fee for a one month extension being paid simultaneously by Electronic Funds Transfers. If other fees are deemed necessary, the Office is authorized to charge them to Deposit Account 20-0809.

The Examiner is invited to contact Applicant's undersigned representative with questions.

Respectfully submitted,

THOMPSON HINE LLP

/Victor J. Wasylyna/

Victor J. Wasylyna
Reg. No. 52,345

Intellectual Property Group
P.O. Box 8801
Dayton OH 45402
937 443 6812
731937